



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/816,232 | 03/26/2001 | Yusaku Fujii | 1075.1153 | 8717 |

21171 7590 09/19/2006

STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

KIM, CHONG R

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2624

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 09/816,232 | Applicant(s) FUJII, YUSAKU | |
| | Examiner Charles Kim | Art Unit 2624 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49, 51 and 53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-28, 31, 34, 37, 40, 43, 46, 49, 51 and 53 is/are allowed.
- 6) ☒ Claim(s) 1-3, 13, 14, 29, 32, 35, 38, 41, 44 and 47 is/are rejected.
- 7) ☒ Claim(s) 4-12, 30, 33, 36, 39, 42, 45, 48, 51 and 53 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment and Arguments

1. Applicant's amendment filed on July 5, 2006 has been entered and made of record.
2. Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicants argue that their claimed invention (claims 1, 13, 14) differ from the prior art because Berger's line segments (curves) "travels from the center of the pattern toward the outside of the pattern, as indicated by the arrows in Figs. 1-4." The examiner disagrees. First, the examiner would like to point out that the arrows in figures 1-4 are solely for *illustrative purposes*--the arrows are used to illustrate the angle of the line segments (curves). For example, in figure 1, each arrow is shown to illustrate the angles (θ_1 , θ_2 , θ_3) of the of curves. Berger explains that these curves "are perpendicular to the tangent to the ellipse at the point of intersection" and "*goes through the origin*, i.e., the core." (col. 3, lines 5-13). Because each curve *goes through the origin*, it is obvious that the curve does not travel from the center of the pattern toward the outside, as applicant contends.

Second, Berger explains that the curves are generated by connecting loci of tangency points (col. 3, lines 23-29). These tangency points are obtained by scanning the fingerprint image using at least a first and second angle scan raster (col. 3, lines 60-col. 4, line 25). Figure 5 illustrates this process. Here, the scanning is performed starting from the outside of the pattern and moving towards the inside of the pattern. Thus, the line segments (curve) go from an outer circumference side of the pattern curves toward the inner circumference side, as claimed.

Applicants also argue that Berger's line segment (curve) generating process "shifts its direction at every intersection with the pattern lines so as to form right angles at each pattern line, without intersecting the pattern lines perpendicularly." The examiner disagrees. As mentioned above, the line segments "are perpendicular to the tangent to the ellipse *at the point of intersection*" (col. 3, lines 5-13). Thus, it is clear that the line segments *do* intersect the pattern lines perpendicularly.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 13, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hara, U.S. Patent No. 6,282,302 ("Hara") and Berger et al., U.S. Patent No. 3,560,928 ("Berger").

Referring to claim 1, Hara discloses a pattern-center determination apparatus for determining a pattern center of a fingerprint-like pattern, which is formed with a number of pattern curves, the apparatus comprising:

a. an auxiliary-line generation section for generating two or more auxiliary lines, from an outer circumference side of the pattern curves of the fingerprint-like pattern toward an inner circumference side of the pattern curves so that each of the two or more auxiliary lines

Art Unit: 2624

intersects each of the pattern curves perpendicularly or substantially perpendicularly (figures 10-11); and

b. a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by the auxiliary-line generation section intersect with each other (col. 3, lines 44-52, col. 8, lines 4-38, and figure 10).

Hara does not explicitly disclose that each of the two or more auxiliary lines includes a number of successive line segments each of which intersects respective one of the pattern curves perpendicularly or substantially perpendicularly. However, this feature was exceedingly well known in the art. For example, Berger discloses two or more auxiliary lines that consists of a number of successive line segments each of which intersects respective one of pattern curves perpendicularly or substantially perpendicularly (figure 1).

Hara and Berger are combinable because they are both concerned with determining the pattern-center of a fingerprint-like pattern. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the auxiliary lines of Hara in view of Berger. The suggestion/motivation for doing so would have been to enhance the flexibility of the system by providing the capability of detecting the center of the fingerprint pattern despite the orientation of the fingerprint (Berger, col. 1, line 68-col. 2, line 2). Therefore, it would have been obvious to combine Hara with Berger to obtain the invention as specified in claim 1.

Referring to claim 2, Hara further discloses that the auxiliary-line generation section is operable to generate two auxiliary lines, and a pattern-center determination section that is operable to determine an intersecting point at which the two auxiliary lines generated by the

Art Unit: 2624

auxiliary-line generation section intersect with each other as a fingerprint-like pattern center (col. 3, lines 44-52 and figures 10-11).

Referring to claim 3, Berger discloses a auxiliary-line generation section operable to generate three auxiliary lines, and an auxiliary-line-intersecting-point calculation section for calculating one intersecting point at which the three auxiliary lines generated by the auxiliary-line generation section intersect with each other, and a most-crowded-point calculation section for calculating a most crowded point, at which the intersecting point calculated by the auxiliary-line-intersecting-point calculation section is most crowded, so as to determine the calculated most crowded point as the pattern center (col. 3, lines 21-37. Note that the one intersecting point is considered the most crowded point).

Referring to claims 13 and 14, see the rejection of at least claim 1 above.

4. Claims 29, 32, 35, 38, 41, 44, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Bergenek et al., U.S. Patent No. 6,241,288 (“Bergenek”), Hara, U.S. Patent No. 6,282,302 (“Hara”), and Berger et al., U.S. Patent No. 3,560,928 (“Berger”).

Referring to claim 29, Bergenek discloses a pattern alignment apparatus for aligning two fingerprint-like patterns, each of which is formed with a number of pattern curves, the apparatus comprising:

a. an alignment-reference determination section for determining one or more alignment references (center region) for each of the fingerprint-like patterns (col. 14, lines 7-10);

b. an alignment section for aligning the two fingerprint-like patterns so that the alignment references of the two fingerprint-like patterns determined by the alignment-reference determination section coincide with each other; the alignment-reference determination section including a pattern-center determination section for determining a pattern center of each of the fingerprint-like patterns as one of the alignment references (col. 14, lines 7-53).

Bergenek does not explicitly disclose that the pattern-center determination section includes an auxiliary-line generation section for generating two or more auxiliary lines extending continuously from an outer circumference side of the pattern curves of the fingerprint-like pattern toward an inner circumference side of the pattern curves so that each of the two or more auxiliary lines intersects each of the pattern curves perpendicularly or substantially perpendicularly and a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by the auxiliary-line generation section intersect with each other. However, these features were exceedingly well known in the art. For example, Hara discloses a fingerprint pattern-center determination section including:

- i. an auxiliary-line generation section for generating two or more auxiliary lines extending continuously from an outer circumference side of the pattern curves of the fingerprint-like pattern toward an inner circumference side of the pattern curves so that each of the two or more auxiliary lines intersects each of the pattern curves perpendicularly or substantially perpendicularly (figures 10-11); and
- ii. a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by the

Art Unit: 2624

auxiliary-line generation section intersect with each other (col. 3, lines 44-52 , col. 8, lines 4-38, and figure 10).

Bergenek and Hara are combinable because they are both concerned with determining the center of a fingerprint-like pattern based on image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the pattern-center determination section of Bergenek in view of Hara's teachings. The suggestion/motivation for doing so would have been to enhance the accuracy of the fingerprint imaging system (Hara, col. 2, lines 41-49). Therefore, it would have been obvious to combine Bergenek with Hara.

Bergenek and Hara do not explicitly disclose that each of the two or more auxiliary lines includes of a number of successive line segments each of which intersects respective one of the pattern curves perpendicularly or substantially perpendicularly. However, this feature was exceedingly well known in the art. For example, Berger discloses two or more auxiliary lines that includes of a number of successive line segments each of which intersects respective one of pattern curves perpendicularly or substantially perpendicularly (figure 1).

Bergenek, Hara and Berger are combinable because they are both concerned with determining the pattern-center of a fingerprint-like pattern. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the auxiliary lines of Bergenek and Hara in view of Berger. The suggestion/motivation for doing so would have been to enhance the flexibility of the system by providing the capability of detecting the center of the fingerprint pattern despite the orientation of the fingerprint (Berger, col. 1, line 68-col. 2, line 2). Therefore, it would have been obvious to combine Bergenek and Hara with Berger to obtain the invention as specified in claim 29.

Referring to claim 32, Bergenek further discloses:

- c. a minutia extraction section for extracting a group of minutiae from each of the two fingerprint-like patterns (col. 14, lines 7-53), and
- d. a collation section for collating the two group of minutiae extracted from the two fingerprint-like patterns by the minutia extraction section based on the alignment by the alignment section (col. 14, lines 7-53)
- e. an adjustment shift calculation section for calculating an adjustment shift of at least one of two fingerprint-like patterns based on a result of a collation by a collation section so that an alignment of the two fingerprint-like patterns is improved (col. 14, lines 7-53); and
- f. an alignment-result adjustment section for shifting at least one of the two fingerprint-like patterns by the adjustment shift calculated by the adjustment-shift calculation section so as to adjust a result of the alignment by an alignment section (col. 14, lines 7-53).

Referring to claim 35, Bergenek further discloses that the adjustment shift is at least one of a rotation angle by which one of the two fingerprint-like patterns is to be rotated around a predetermined point with respect to the other of the two fingerprint-like patterns and a shift by which one of the two fingerprint-like patterns is to be parallelly shifted with respect to the other of the two fingerprint-like patterns (col. 14, lines 7-53).

Referring to claim 38, Bergenek discloses a pattern verification apparatus for verifying a group of object minutiae for verification extracted from an object fingerprint-like pattern for verification with a group of registered minutiae extracted in advance from a registered fingerprint-like pattern, each of the object fingerprint-like pattern and the registered fingerprint-like pattern being formed with a number of pattern curves, the apparatus comprising:

Art Unit: 2624

a. a pattern inputting section for inputting the object fingerprint-like pattern (col. 14, lines 7-53);

b. an alignment-reference determination section for determining one or more alignment references (center region) of the object fingerprint-like pattern inputted by the pattern inputting section (col. 14, lines 7-53);

c. a minutia extraction section for extracting the group of object minutiae from the object fingerprint-like pattern inputted by the pattern inputting section (col. 14, lines 7-53);

d. a registration-data obtaining section for obtaining registration data regarding the registered fingerprint-like pattern, the registration data including the group of registered minutiae and one or more alignment references (center region) of the registered fingerprint-like pattern (col. 14, lines 7-53);

e. an alignment section for aligning the object fingerprint-like pattern or the group of object minutiae and the group of registered minutiae so that the alignment references of the object fingerprint-like pattern determined by the alignment-reference determination section and the alignment references of the registered fingerprint-like pattern obtained by the registration-data obtaining section coincide with each other (col. 14, lines 7-53);

f. a verification section for verifying the group of object minutiae with the group of registered minutiae based on the alignment by the alignment section (col. 14, lines 7-53);

the alignment-reference determination section including a pattern-center determination section for determining a pattern center of the object fingerprint-like pattern as one of the alignment references of the object fingerprint-like pattern, the alignment references of the

Art Unit: 2624

registered fingerprint-like pattern including a pattern center of the registered fingerprint-like pattern (col. 14, lines 7-53).

Bergenek does not explicitly disclose that the pattern-center determination section includes an auxiliary-line generation section for generating two or more auxiliary lines extending continuously from an outer circumference side of the pattern curves of the fingerprint-like pattern toward an inner circumference side of the pattern curves so that each of the two or more auxiliary lines intersects each of the pattern curves perpendicularly or substantially perpendicularly and a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by the auxiliary-line generation section intersect with each other. However, these features were exceedingly well known in the art. For example, Hara discloses a fingerprint pattern-center determination section including:

- i. an auxiliary-line generation section for generating two or more auxiliary lines extending continuously from an outer circumference side of the pattern curves of the fingerprint-like pattern toward an inner circumference side of the pattern curves so that each of the two or more auxiliary lines intersects each of the pattern curves perpendicularly or substantially perpendicularly (figures 10-11); and

- ii. a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by the auxiliary-line generation section intersect with each other (col. 3, lines 44-52 , col. 8, lines 4-38, and figure 10).

Bergenek and Hara are combinable because they are both concerned with determining the center of a fingerprint-like pattern based on image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the pattern-center determination section of Bergenek in view of Hara's teachings. The suggestion/motivation for doing so would have been to enhance the accuracy of the fingerprint imaging system (Hara, col. 2, lines 41-49). Therefore, it would have been obvious to combine Bergenek with Hara.

Bergenek and Hara do not explicitly disclose that each of the two or more auxiliary lines includes of a number of successive line segments each of which intersects respective one of the pattern curves perpendicularly or substantially perpendicularly. However, this feature was exceedingly well known in the art. For example, Berger discloses two or more auxiliary lines that includes of a number of successive line segments each of which intersects respective one of pattern curves perpendicularly or substantially perpendicularly (figure 1).

Bergenek, Hara and Berger are combinable because they are both concerned with determining the pattern-center of a fingerprint-like pattern. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the auxiliary lines of Bergenek and Hara in view of Berger. The suggestion/motivation for doing so would have been to enhance the flexibility of the system by providing the capability of detecting the center of the fingerprint pattern despite the orientation of the fingerprint (Berger, col. 1, line 68-col. 2, line 2). Therefore, it would have been obvious to combine Bergenek and Hara with Berger to obtain the invention as specified in claim 38.

Referring to claim 41, Bergenek further discloses that the pattern inputting section is operable to input the registered fingerprint-like pattern, the alignment-reference determination

Art Unit: 2624

section is operable to determine the alignment references of the registered fingerprint-like pattern inputted by the pattern inputting section, the minutia extraction section is operable to extract the group of registered minutiae from the registered fingerprint-like pattern inputted by the pattern inputting section, and the registration-data obtaining section is operable to obtain both the alignment references of the registered fingerprint-like pattern determined by the alignment-reference determination section and the group of registered minutiae extracted by the minutia extraction section as the registration data regarding the registered fingerprint-like pattern (col. 14, lines 7-53).

Referring to claim 44, Bergenek further discloses an adjustment-shift calculation section for calculating an adjustment shift of a group of object minutiae or/and a group of registered minutiae based on a result of a verification by a verification section so that the alignment of the group of object minutiae and the group of registered minutiae is improved; and an alignment-result adjustment section for shifting the group of object minutiae or/and the group of registered minutiae by the adjustment shift calculated by the adjustment-shift calculation section so as to adjusting a result of the alignment by the alignment section; a verification section being operable to output a result of the verification between the group of object minutiae and the group of registered minutiae based on the adjustment of the alignment result by the alignment-result adjustment section (col. 14, lines 7-53).

Referring to claim 47, Bergenek further discloses that the adjustment shift is at least one of a rotation angle by which at least one of the group of object minutiae and the group of registered minutiae are to be rotated around a predetermined point with respect to the other of the two groups of minutiae and a shift by which at least one of the group of object minutiae and the

Art Unit: 2624

group of registered minutiae are to be parallelly shifted with respect to the other of the two groups of minutiae (col. 14, lines 7-53).

Allowable Subject Matter

5. Claims 15-28, 31, 34, 37, 40, 43, 46, 49, 51, 53 are allowed.
6. Claims 4-12, 30, 33, 36, 39, 42, 45, 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ck

September 7, 2006

JINGGE WU
PRIMARY EXAMINER

